

# **The Water-Wise Gardener Program: Teaching Nutrient Management to Homeowners**

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## **Introduction**

The Water-wise Gardener program was developed by Virginia Cooperative Extension (VCE) seven years ago with funding from the Cooperative State Research, Education, and Extension Service (CSREES) of the U.S. Department of Agriculture (USDA). It is an educational program aimed at reducing non-point source pollution from suburban residential areas. The educational focus is upon nutrients, especially nitrogen and phosphorus from lawn fertilizer over-application or misuse. The program seeks to reduce such nutrient pollution to Virginia waterways, and eventually the Chesapeake Bay, through the recruitment of homeowner participants from impaired watersheds. Participating homeowners attend educational seminars on lawn best management practices, are partnered with a Master Gardener volunteer, and are expected to keep accurate records and implement recommended practices. The program, which is currently being implemented in 12 urban/suburban Virginia counties, is supported by a combination of local county funds, grants from the Virginia Water Quality Improvement Act, and funds from USDA. Cooperative Extension Units in North and South Carolina have replicated the program.

## **How the Program Works**

The Water-wise Gardener program begins by recruiting homeowners from watersheds with impaired streams or other identified problems to participate in a year-long lawn care educational program. The most successful recruitment method to-date has been to conduct a "reverse search" on the Internet by street name. Once names and addresses are identified, a recruitment letter is sent personalized for the watershed; e.g., "Dear Resident of the Bull Run Watershed." The letter invites the homeowner to participate in the program and lists the benefits of participation, such as free seasonal seminars with regional experts, visits from a Master Gardener (volunteers trained by VCE in various aspects of horticulture), a free soil test, and Virginia Tech publications. In order to be enrolled in the program, the homeowners must return a completed pre-survey and a signed agreement form that details their obligation to the program. The pre-survey asks questions about their lawn care practices and attitudes before program involvement, as well as demographic information such as race, gender, income, and education levels. A stamped, self-addressed envelope is included for ease of return. For every 100 letters sent out, between 20-30 are typically returned. A simple database program keeps track of participants and their lawn care data. A reporting system on the Virginia Tech Intranet is currently being designed to record this information on a statewide basis by hydrologic unit.

Once enrolled, participants are assigned a personal Master Gardener. The Master Gardener schedules a visit with the homeowner to discuss his or her lawn. All Master Gardeners are instructed to stay outside on the lawn and not to go inside anyone's home. Some choose to bring along a spouse, friend, or another Master Gardener. At this visit, the Master Gardener works with the homeowner to correctly measure the square footage of lawn area, determine the type and variety of grass, collect a soil sample, and ascertain previous fertilization practices and amounts previously applied, if known. This information forms the basis of a personalized lawn care plan for the homeowner. Master Gardeners also answer other questions the participant may have; common questions include weed and pest identification, what plant grows best where, and why certain plants are not thriving. The Master Gardener leaves a business card with a phone number or e-mail where he or she can be reached for further questions throughout the program year. All Master Gardeners receive 50 hours of classroom training as well as supplemental field training before being assigned to homeowners. Typically, a Master Gardener will be assigned to between 5-10 homeowners.

In addition to the one-on-one visits from Master Gardeners, homeowners attend seasonal seminars on timely topics of interest to those with lawns. In Northern Virginia, where cool-season grasses like Fescue and Bluegrass predominate, fall topics include soil testing, fertilization, core aeration, and over seeding. Spring topics include mowing and pruning, integrated pest management, and proper watering and planting. Popular locations for seminars include parks with covered pavilions, school auditoriums, county buildings, and libraries. Any easily accessible public location large enough to hold 50 to 100 people comfortably, and accessible to wheel chairs, will work. If held inside, cold temperatures, rain, or wind are not a problem; however, an outside area for demonstration purposes is essential. State and regional Cooperative Extension experts are recruited for the seminars to answer questions. Master Gardeners are also present, with various displays, to answer questions and to meet with their assigned participants.

A professional-quality newsletter is sent to all participants approximately six times per year. A grant-paid editor solicits articles that reinforce or complement topics taught at the seminars. Articles on various aspects of watershed management are also introduced. The newsletter is made available electronically to other Extension Agents for editing and reproduction elsewhere.

After participants have attended fall and spring seminars, they are visited again by their Master Gardener to collect final lawn data and conduct a post-survey of practices and attitudes. The most important piece of data collected is the amount of fertilizer now being applied. Square footage of turf can be re-checked, if needed, and questions answered.

The homeowner may choose to participate again the following year, or to offer their lawn as a demonstration lawn, and erect a sign in their yard to promote the program in the community. The post-surveys and data sheets are collected from all participants annually. Results are compiled and analyzed by a grant-paid technician and a final report generated for each Cooperative Extension unit as well as an overall report for statewide efforts.

## Results

Data for the period March 1998 to June 1999 for the Virginia counties of Arlington, Loudoun, and Prince William shows 326 individual homeowner participants. These 326 homeowners managed 57.1 acres of turf in 11 different hydrologic units in the Northern Virginia area. Between 100-200 additional individuals attended seminars but did not participate in the pre- and post-survey and data collection.

Accurate information on amounts of nitrogen and phosphorus applied by participants before program involvement is difficult to get. Most did not remember how much fertilizer they had applied in the previous year. Many stated the reason they joined the program was in order to understand how much fertilizer to apply. A total of 72 participants reported pre-program fertilizer application of 1,062 pounds of nitrogen. The same 72 participants reported 762 pounds of nitrogen applied after program involvement, or a reduction of 300 pounds. Information on pre- and post-phosphorus was not collected.

Pre-surveys indicated that only 12% of all participants had soil tested for their lawns prior to applying fertilizer. Homeowners not testing soil are more likely to apply excess fertilizer. For this reason, Virginia Tech recommends soil testing as a nutrient management practice for home lawns. Post surveys show 95% of participants returning surveys tested soils after program involvement. Another important nutrient management practice for homeowners with cool-season turf is to fertilize in the fall, when uptake by roots occurs best. Pre-surveys indicated that only 32% were fertilizing at this time of year, while post surveys indicated that 64% were fertilizing in the fall. Similar increases were also observed for recommended practices such as aeration (from 34% to 83%), and over-seeding (from 35% to 76%). An increase in the number of participants not watering the lawn at all in the summer also increased (from 18% to 44%) (Figure 1).

Demographics from the program indicate that 72% of participants were male and 28% female. Participants were overwhelmingly white (89%); followed by black (7%), Asian (4%), and Hispanic (1%). The majority (42%) had a four-year college degree and a gross family income of over \$70,000 a year (54%). More than one-third of the lawns were between 5,000 and 10,000 square feet (35%).

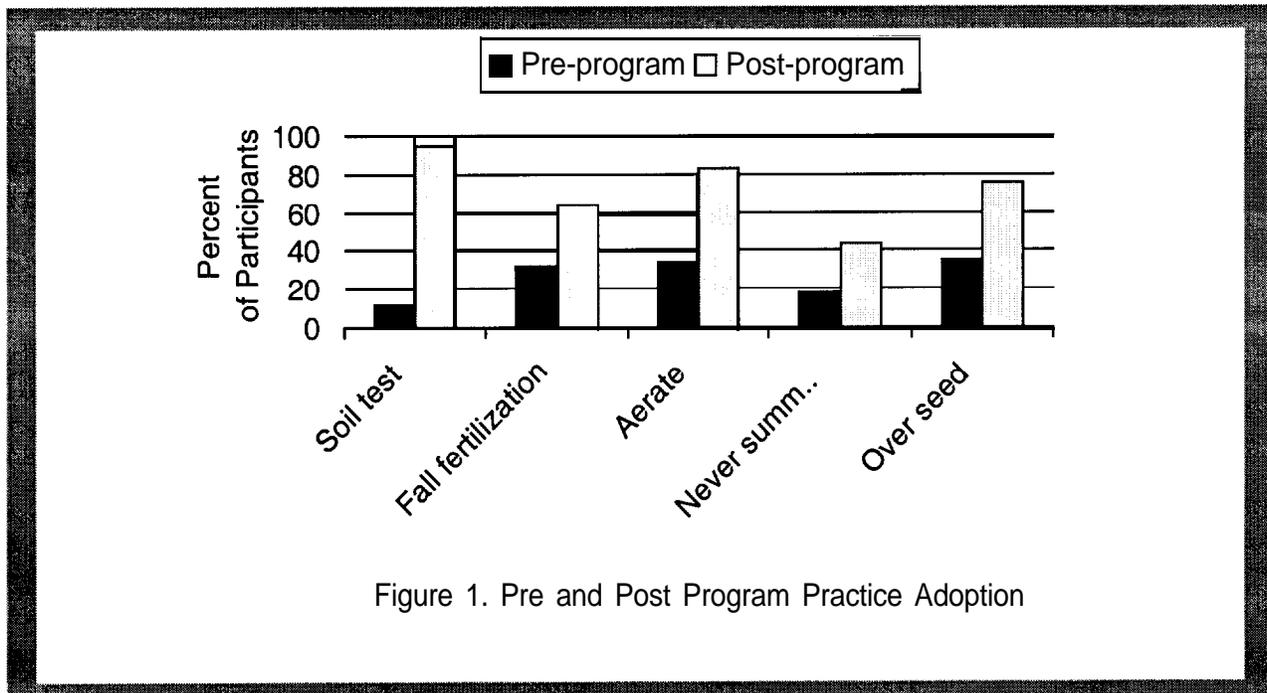


Figure 1. Pre and Post Program Practice Adoption

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## Conclusions and Lessons Learned

The Water-wise Gardener Program was successful at reaching the intended audience and achieving adoption of nutrient management practices. Based on the success of the program, it appears that suburban homeowners can be recruited to maintain their lawns according to recommended practices. Homeowners are willing, with the help of Master Gardener volunteers in some cases, to keep records on their nutrient use as a part of program participation. Although 326 individuals and 57 acres of turf may seem low for an area like Northern Virginia, it is significant for a populace that does not traditionally participate in water quality educational programs. Considering that most lawns in suburban subdivisions have a turf area of around 5,000 square feet, clearly many individuals will need to be enrolled to reach meaningful numbers.

The study showed that it is difficult to obtain information on pre-program nutrient use for most participants. Most homeowners cannot provide accurate nutrient use data from the previous 6-12 months. They simply do not remember how much nitrogen and phosphorous was in the fertilizer bag applied last spring or fall. However, after program involvement, they do appear to understand how much nitrogen they applied and the square footage of their turf. From a water quality public policy perspective, it may be preferable to record nutrient use after program involvement and consider participants' turf square footage as the urban nutrient management measurement. In this way, the focus could be upon recruiting more and more individuals to participate in nutrient management educational programs like the Water-wise Gardener, thus increasing the number of acres addressed by urban nutrient management efforts. Such an approach could easily be integrated into local Geographic Information Systems, providing localities a simple method of accounting for and reporting on urban nutrient management. Localities interested in a program like the Water-wise Gardener should contact their local Cooperative Extension office to see if a similar project is already occurring or could be developed. As this program is being continued and expanded in the 1999-2001 time frame, the opportunity to better define what is realistic as an urban nutrient management measurement for homeowners will hopefully occur.